

Melissa Woehr
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DownHome: Accommodating Identity, Ownership and Permanence in Urban Housing

Thesis Statement: Urban housing must meet the desires and realities of the American Dream to stunt the negative environmental consequences of suburban sprawl.

This project is intended to address two significant problems present in Portland and indicative of issues in many other cities. The first is that suburban sprawl is continuing despite rising energy costs and increased awareness of its negative environmental impact. Demand continues for the detached, single family house with its own yard, and there is no surprise that it does. Suburban homes offer a sense of personal ownership and identity, defined boundaries of private and public life, and a strong relationship with outdoor space. These qualities are not commonly found in urban housing. The second issue is well documented in Portland: there is a scarcity of middle-income and family housing available within the central city (Portland Development Commission).

Suburban sprawl and a lack of flexibility in urban housing are closely linked together, and they reveal a division in housing options between the city and the suburb. Although these two areas are naturally different, the current situation is unnecessarily extreme to the detriment of the metropolitan region as a whole. A 2005 PDC market assessment revealed that as many as 26,000 metropolitan households with children and the financial means to buy a condo would do so if a family-oriented condo unit was available (Ferranini & Associates). There must be housing options within the city that will appeal to and accommodate groups that would otherwise have to move to the suburbs.

This project proposes to create mid-rise condominium units just outside the northwestern boundary of the Portland River District, around the I-405/Rt. 30 connection. Its design will be informed by the suburban housing attributes, with focus on providing appropriate space for a

range of households, including different types of families, and how this new housing form can incorporate sustainable aspects.

Energy and land conservation are driving forces of this project. While the merits and faults of suburbia can be debated across many disciplines, the energy and land consumed by its high percentage of infrastructure is proven. If this project is successful in showing there is an alternative to sprawl, energy consumption is automatically reduced. This project should be an example of good urban architecture as well, and part of achieving that goal is being environmentally responsible. Many of the design decisions made to create light and air filled units with integrated outdoor space will be beneficial from an energy use standpoint as well as creating pleasant living spaces.

The site and program offer opportunities for many energy conservation strategies. Its location in Portland offers opportunities for a connection to mass transit. This bioclimatic region makes passive heating and cooling strategies possible, and supplies more than enough rain to be harvested for grey water needs. Because the project will be predominantly residences, the grey water load from toilet flushing will be significant. There will also be a high electricity load from lighting, kitchen and laundry appliances, and home offices. This load can be reduced by using compact fluorescent lights and energy-star appliances.

Site development strategies will also be important to reduce energy consumption and environmental impact. The site is currently an expansive parking lot, making it a large heat island. Developing this site with housing that has a lot of outdoor vegetated space will reduce the heat island effect. Although this site will be a fairly high density, open spaces can be designed so that these pervious surfaces have good infiltration. The building massing will focus on maximizing the amount of light to all units. Doing so will be beneficial from a design standpoint and will reduce the energy requirements of heating and lighting. Achieving this goal will most likely involve central outdoor open space and long, narrow units with exposure on at least two sides, making them optimal for cross-ventilation during the cooling season.

The building heights will vary to act as a transition from the single-family houses to the industrial buildings and elevated freeway in the surrounding area. This change in height will present an opportunity for improved solar exposure because the lower scale development is located on the southern boundary of the site. Sun studies will be important throughout the design phase to find an optimal height-to-width ratio of open spaces between the buildings. An estimate

revealed that a ratio of .5 to 1.8 will be needed (Brown and DeKay 111). At this ratio, ventilation will be 5% to 40% effective (Brown and DeKay 117). These studies indicate that a high percentage of operable glazing will be needed.

Energy conservation on a regional scale is one of the driving conceptual forces of this project. From a regional scale of living in a city, and from a building scale of designing units with a strong connection to the outdoors, this project will express that energy efficient design is naturally linked to the design of a pleasant and active space.

Potential Strategies:

Passive Cooling:

Cross-ventilation within units: narrow units, operable windows on at least two sides

Courtyard/open space within building wide enough to allow wind circulation

Shading: vegetation and louvers

Wind chimneys

Passive Heating:

Solar orientation: southern exposure and open space between units, massing to step down to the south.

Thermal mass: thick walls and floors (sound privacy between units)

Water:

Rain water collection for grey water recycling

Permeable surfaces and native vegetation for infiltration

Energy:

Reduce usage through passive strategies and daylighting

Geothermal and/or radiant heating in addition passive heating

Works Cited:

Brown, G. Z. and Mark DeKay. *Sun, Wind & Light: Architectural Design Strategies*. 2nd ed.
New York: John Wiley & Sons, 2001.

Cogan Owens Cogan, Johnson Gardner, and Moore Information. *2002 Greater
Downtown Portland Housing Report*.

Ferranini & Associates, Inc. *Market Assessment for Family-Oriented Condominiums in
Portland, Oregon*. February 2006.

Portland Development Commission. *2005 Central City Housing Inventory*. October 2005.

Portland Development Commission. *River District Housing Implementation Strategy 2006
Annual Report*. June 2007.

Space Sequence:

Entrance to Development

Gateway, one story high, open to elements

30x20

Open Space

Four to five stories tall. Outdoor. Partially shaded by the surrounding buildings. Partially hardscape and partially landscaped. May have parking below.

60x120

Entrance to Unit

Stoop or small passageway. Landscaping/planters to separate unit from semi-public walkway.

4x8

Living Space – Indoor

The central space—connected to outdoor space, kitchen, and eating area. Secondary connection to work space and entrance.

12x18

Living Space – Outdoor

This outdoor space must be much more than a traditional balcony. Instead, this space should act as an extension of the indoor living space—like a well-designed back yard deck. It will be a place of play, eating, leisure, and creative work. Connected to eating area and indoor living space.

12 x 18

Kitchen

An efficient working kitchen layout, open to eating place and living space. Will require a high level of lighting and ventilation.

9x 9

Eating Place

This should be a well-defined area between the kitchen and living space, but does not have to be its own room. It will need flexible lighting levels.

8x12

Sleeping Places

Spaces of retreat from the rest of the dwelling area. Lower lighting levels. Separate temperature controls. Will be used at opposite times from the rest of the unit.

10x12

Working Space

Can be a nook rather than a separate room from the living space. High level of task lighting.

6x10

Bathroom(s)

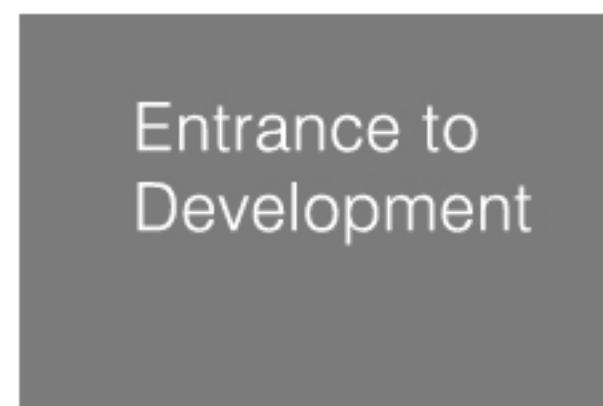
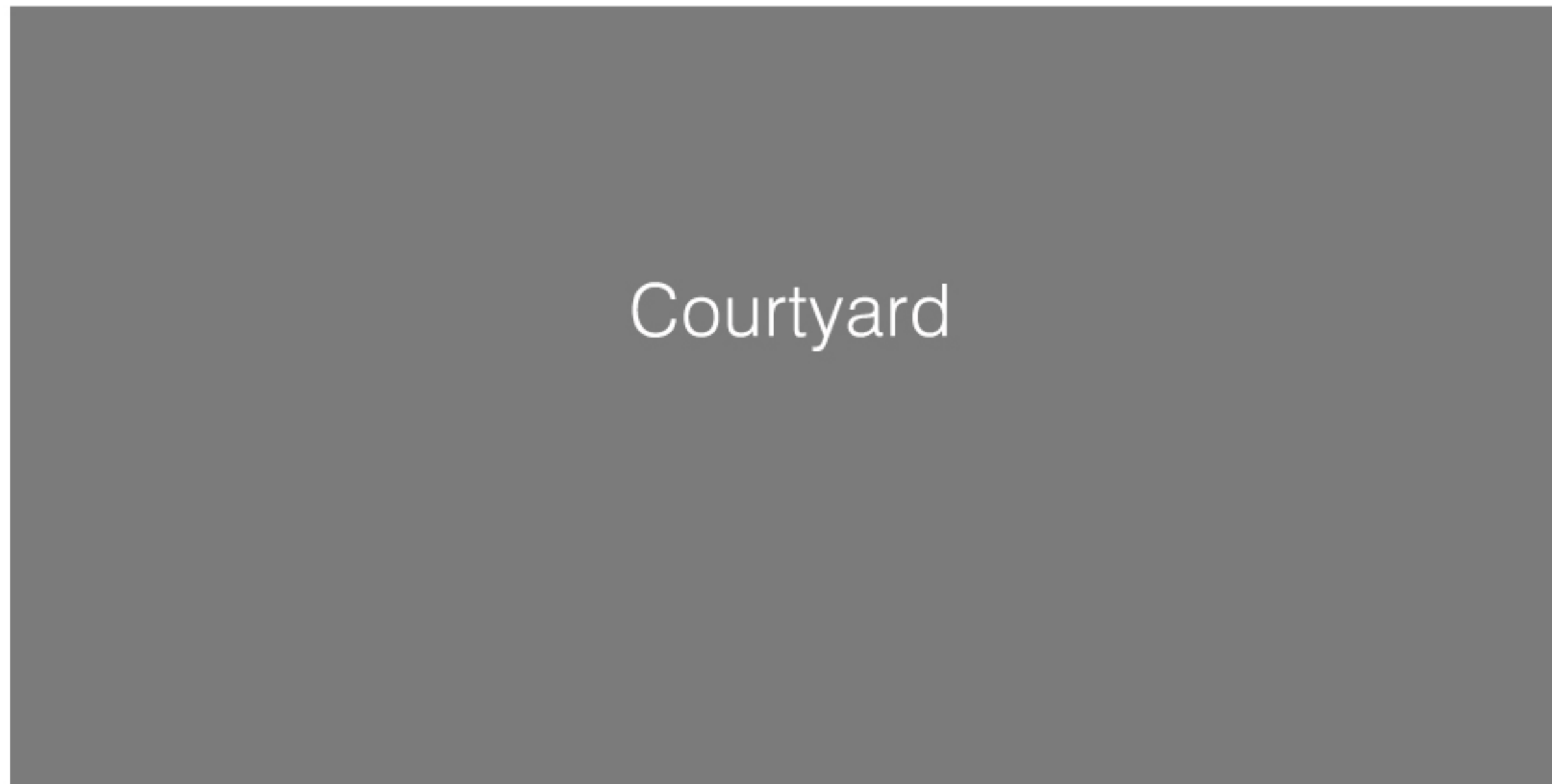
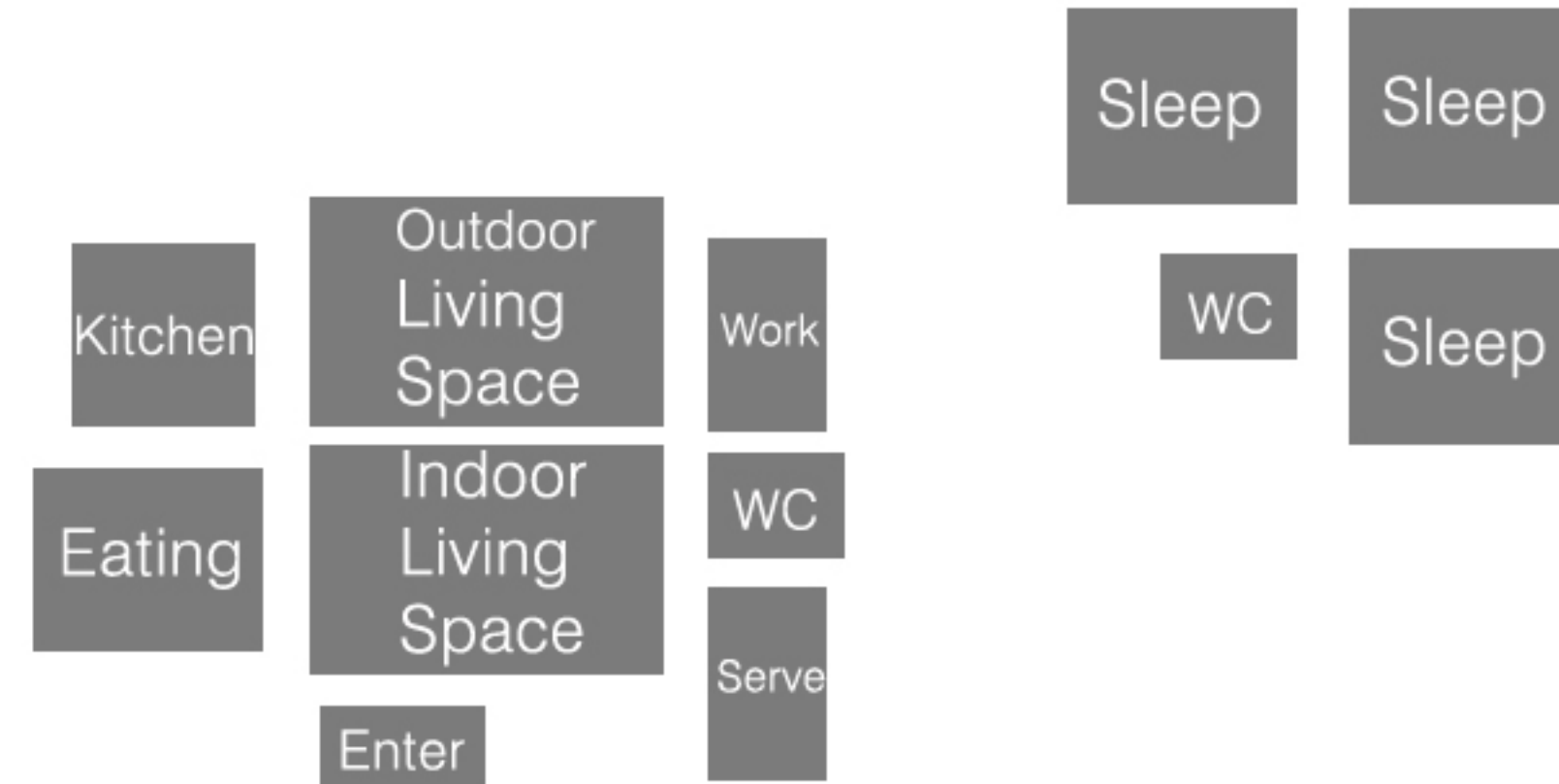
5x7

Service Spaces

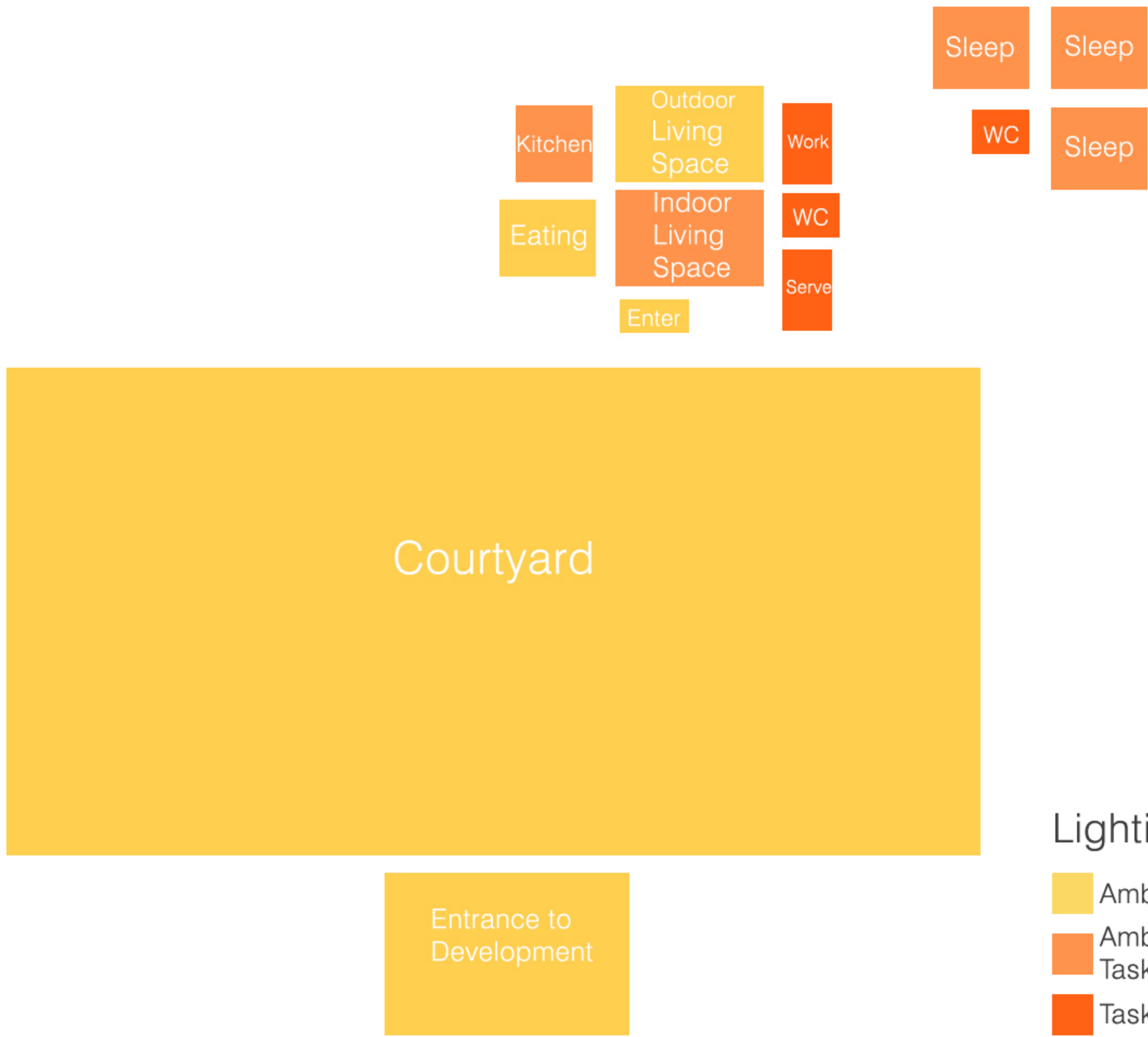
High level of task lighting. Will contain some appliances—washer and dryer in particular.

6x10

Entrance to Development: 30x20
Open Space: 60x120
Entrance to Unit: 4x8
Living Space: indoor 12x18
 outdoor: 12x18
Kitchen: 9x9
Eating Place: 8x12
Sleeping Places: 10x12
Working Space: 6x10
Bathrooms: 5x7
Service Space: 6x10

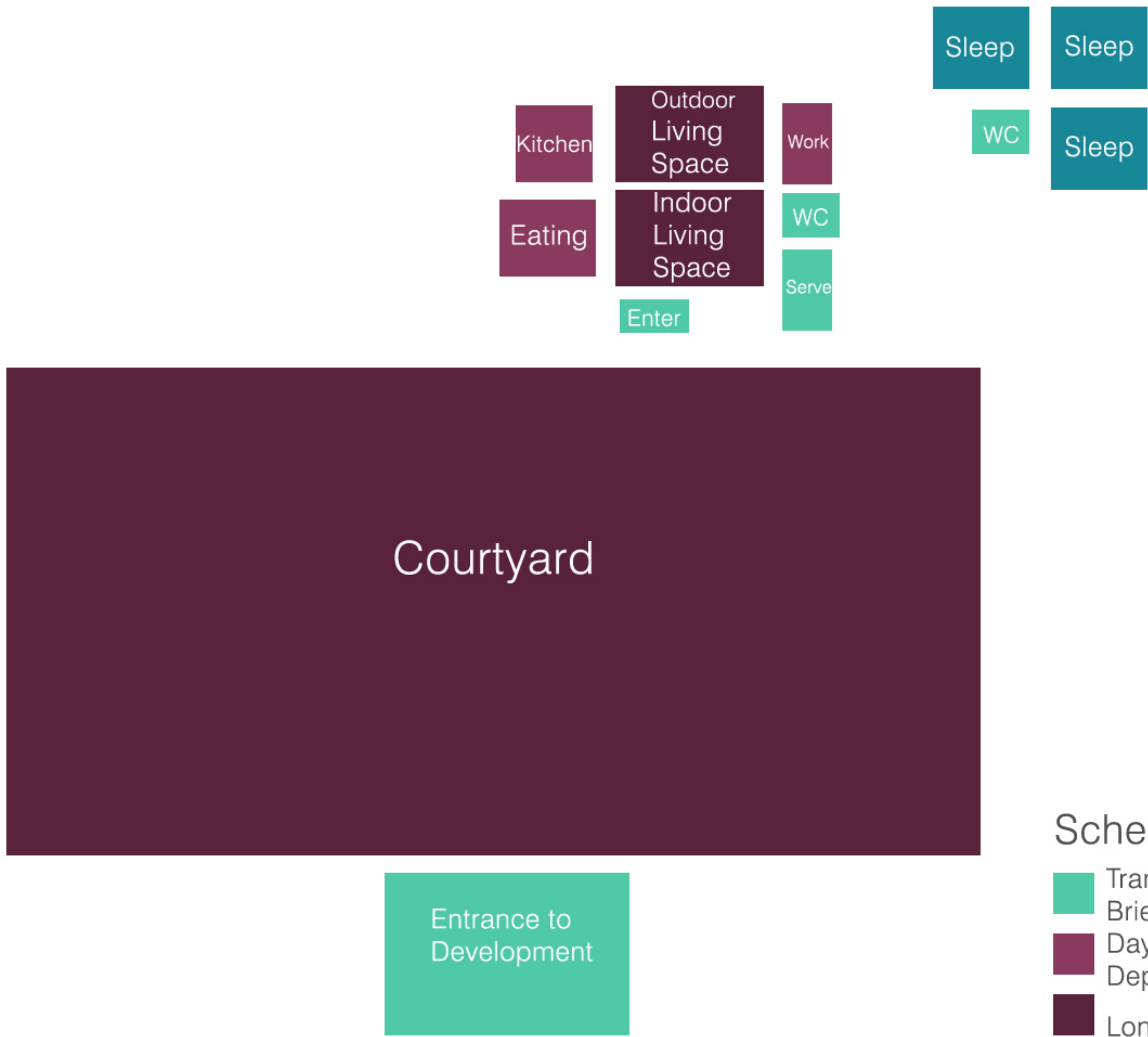


Spaces

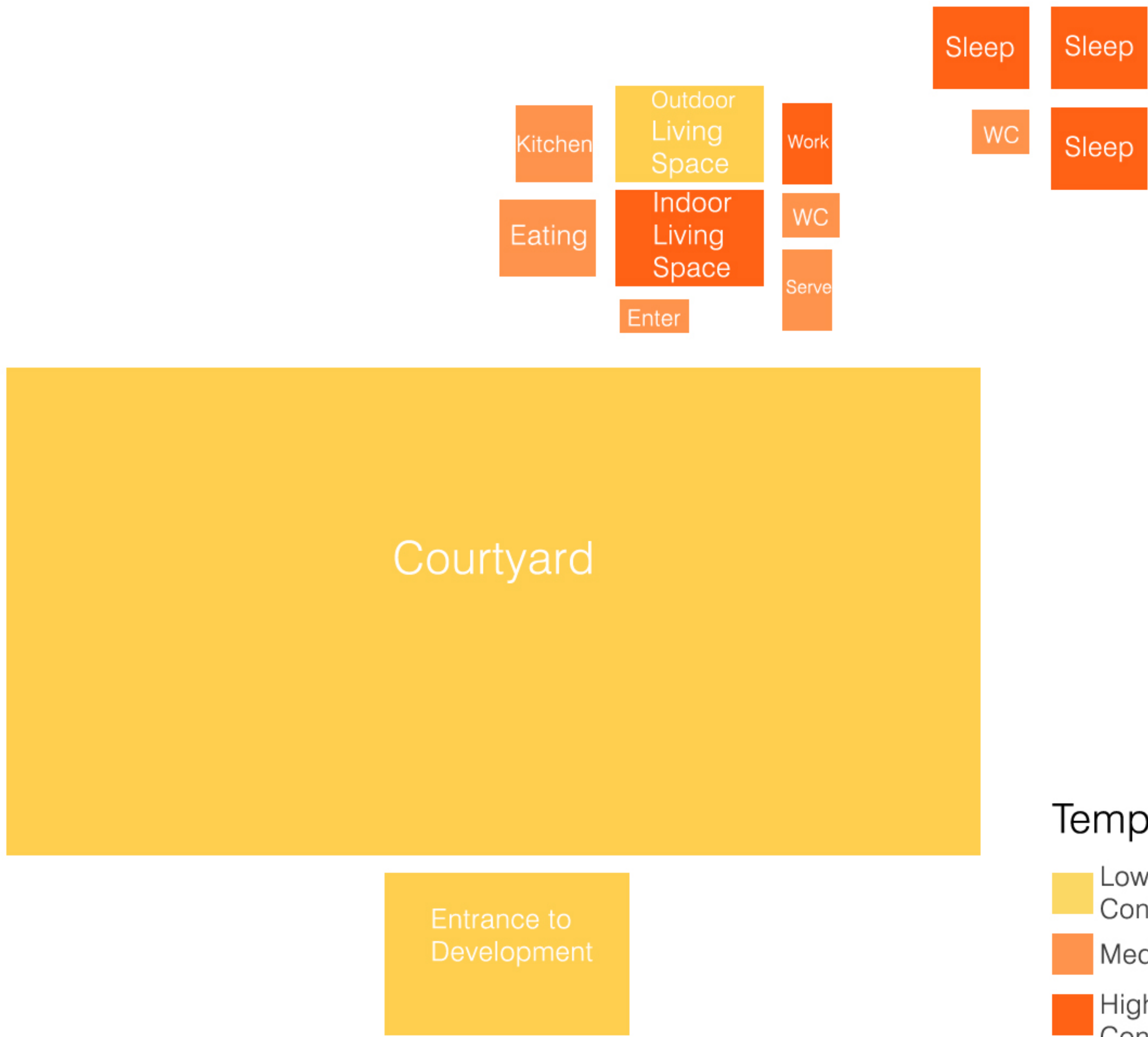


Lighting

- Ambient Light
- Ambient and Task Lighting
- Task Lighting



- ### Schedule
- Transition / Brief
 - Day, Task Dependent
 - Long



Temperature

- Low Thermal Control
- Medium
- High Thermal Control